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(56) Documents cited

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US 4531728

US 4618143

US 4461473

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(58) Field of search

A6M

Selected US specifications from IPC sub-class A63B

## (54) Physical exercise bars

(57) A bar (10,11) for lifting and manipulating weights has handles (13) which are rotatable about axes normal to the length of the bar. They may be free or subject to friction or locking devices, the latter setting them at selected rotational positions for particular exercises. The handles (13) are conveniently within rings (12) captive within a central frame (11), bar portions (10) extending from opposite ends of the frame. The weights are held captive on the bar portions (10) by collars (23) with a cam locking lever (28, 29).

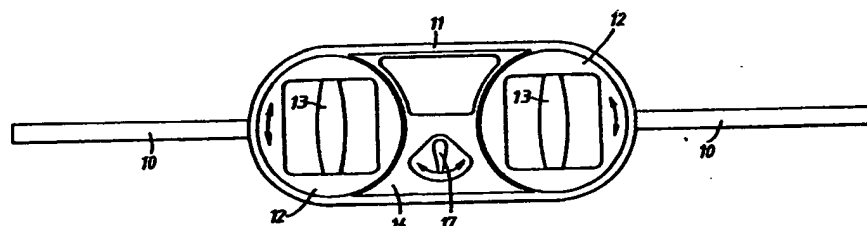


FIG. 3.

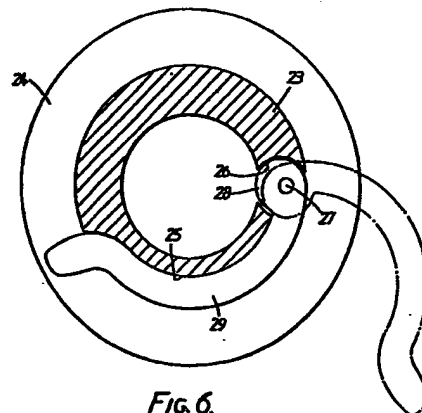


FIG. 6.

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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## SPECIFICATION

## Improvements relating to physical exercising bars

- 5 This invention relates to physical exercising bars.  
Keeping fit and body building are widely practised. One important aspect is lifting weights and, when lifted, manipulating them. This develops arm and shoulder muscles particularly.
- 10 A conventional lifting bar is straight. Disc weights can be mounted on the ends and secured by collars, and these can be replaced as necessary by different weights, or have further ones added.  
A straight bar determines that the lifter's hands are
- 15 in a particular attitude in relation to his arms. They must always remain in alignment, whatever the state of the lift. This causes particular muscles to come into play, while others do little or no work.  
It has been found that this attitude of the hands is
- 20 not as good for biceps and triceps as if they were at an angle. A more suitable bar has therefore been developed, known as a curl bar, an example of which is shown in Figure 1 of the accompanying drawings. This bar has aligned straight end portions 1 for
- 25 receiving weights 2 in conventional fashion, and a straight centre portion 3. Between the portions 1 and 3 there are shallow zig-zag sections 4, and the middle portion of each of these sections serves as a handle or grip 5. It will be seen that, when held, the hands
- 30 will be mutually twisted symmetrically about the centre point.  
Even this does not provide a complete answer, and another device has been developed as shown in Figure 2. This is known as a triceps exerciser, as it is
- 35 these muscles which are particularly brought into play.  
This exerciser has two aligned straight end portions 6 on which weights 7 can be mounted in conventional fashion. The portions 6 project from
- 40 the ends of an oblong loop 8 which is spanned in the transverse direction by two bars 9, symmetrically placed either side of the centre. These serve as handles, and it will be appreciated that, when gripped, the hands will be parallel, in mirror
- 45 relationship.  
With all these rigid structures, there is inevitably some limitation of versatility, and it is the aim of this invention to provide an exerciser which may combine several functions.
- 50 According to the present invention there is provided a physical exercise bar on whose opposite ends selected weights can be mounted, the bar having intermediate handles whose positions can be varied.
- 55 Preferably, the handles are rotatable about axes transverse to the longitudinal direction of the bar. The handles may be freely rotatable, provision may be made for locking them into position, or their freedom of rotation may be adjustable by friction
- 60 means. The possible rotation may be through a full 360°.  
Conveniently, the handles are mounted on rings captive to a frame forming an intermediate section of the bar, the handles being diametral elements
- 65 spanning the respective rings.

The frame will usually be oblong with rounded ends and these may be engaged by approximately half the circumference of the rings. A retaining member with concave ends to be engaged by the other circumferential portions may then be fitted within the frame to keep the rings captive.

70 It is important with such exercise bars that the weights should be firmly held. If they are slightly loose, they can "slop about" and adversely affect the exercise, or even work loose and slide clear of the bar altogether. With heavy weights, that can be extremely dangerous. Present means for holding the weights are not entirely satisfactory, tending to be too insecure or too complicated.

80 According to another aspect of this invention there is provided a clamp comprising a collar and cam means pivotally mounted thereon to be movable between two positions, in one of which a portion thereof projects inwardly of the internal

85 circumference of the collar and in the other of which no portion so projects.

Preferably, the cam has an over-centre action in which another portion thereof projects inwardly to a greater extent than the first portion at a position

90 intermediate said two positions.

Preferably, the cam will pivot on an axis parallel to the collar axis, and it may be housed in a radial aperture in the collar. Conveniently, it will have an operating lever which, in said one position, closely

95 embraces a substantial portion of the outer circumference of the collar. This may be recessed to house the lever, which would then have an end portion which would remain proud of the recess where the cam is in said one position.

100 For a better understanding of the invention, one embodiment will now be described, by way of example, with reference to the remaining figures of the accompanying drawings, in which:

*Figure 3* is a face view of a physical exercise bar,

105 *Figure 4* is a detail of a catch mechanism incorporated in the bar,

*Figure 5* is a perspective view of a collar for clamping weights on the bar, and

*Figure 6* is a cross-section of the collar.

110 The bar has two aligned end portions 10 on which weights (not shown) can be mounted in a conventional manner and fixed by means of the collars to be described later. These portions project from the rounded ends of an oblong frame 11. Fitting

115 into each end of the frame is a ring 12 diametrically spanned by a handle 13. The frame 11 is of circular section tubing, and the rings 12 each have a concave rim to half embrace that tubing around the associated end of the frame and be retained by it.

120 The central portion of the frame 11 is occupied by a retaining plate 14 with concave ends, in face view, to fit snugly around the other half circumferences of the rings 12. In cross-section these ends are convexly rounded, matching the tubing, to be received by the concave rims of the rings. The parallel edges of the plate 14 are concave in cross-section to receive the straight portions of the frame 11. The plate 14 may be of stiffly resilient plastics material, so that it can be snapped into place with the rings 12.

130 The rings can be rotated in either direction as

indicated by the arrows in Figure 3, the handles being turned about axes transverse to the longitudinal direction of the bar. In the position illustrated there, the bar will perform as the triceps exerciser of Figure 2, but the rings can be rotated so that, in effect, it will be a curl bar as in Figure 1. Any intermediate position can be selected, or positions outside that range.

The rings may be allowed to rotate freely through 360°, or the plate 14 could carry a device which could be expanded against the rings to increase the friction on them and make turning them progressively more difficult. One exercise could be, when carrying weights, to twist the grips 13 through certain angles. However, in the preferred form there is a mechanism for locking the rings in selected positions, as shown in Figure 4. The retaining plate 14 has a well or recess 15 in which is mounted a cam 16 which can be rotated by a locking lever 17 shown in Figure 1. On either side of the cam there are springs 18, each with one end anchored in the body of the retaining plate, but otherwise extending generally along opposed walls of the recess 15 adjacent respective rings 12. Near the anchored end, each spring 18 has a pin 19 which co-operates with the cam 16, while at the free end there is another, locking pin 20, on the opposite side the the spring, slidably fitting an aperture 21 open to the curved edge of the retaining plate. The rings 12 have recesses 22 around their peripheries, in any one of which these locking pins 20 can fit when they are brought into registry. These recesses 22 need only extend over one quarter of the circumference of each ring, but it may be preferred to have more. For example they might be spaced with a certain pitch (15° say) over one quarter and another pitch (22 1/2° say) over another quarter.

In the position shown, the cam 16 is disengaged from the pins 19, the springs are relaxed and the locking pins 20 are withdrawn, allowing the rings 12 to be freely rotated. When they have been turned to the selected positions the cam 16 can be rotated, entering the pins 20 in opposed recesses 22 and thus locking the handles.

Should these recesses 22 not be in precise registry with the apertures 21, this will not prevent the cam 16 being rotated. It can still be turned, making the springs 18 flex outwardly over their central portions. It will be apparent to the user by feel that the locking pins 20 are not properly engaged and he then only needs to twist the handles 13 a little this way and that until the pins 20 snap into place with an audible click.

The rings 12 are released simply by turning the cam 16 back again, allowing the springs 18 to withdraw the pins 20. Since the pins 20 are recesses 22 are not visible on the assembled exercise bar, assistance with registering them can be provided by marks on the rings 12 and plate 14.

Referring now to Figures 5 and 6, there is shown a device for retaining weights on end portions of the bar. It comprises a cylindrical collar 23 with an annular flange 24 at one end, this being the one to abut against a weight. The collar is cut-away over about half its outer circumference, between the flange and the opposite end, and at one end of the

recess 25 there is a radial aperture 26. This is spanned by a pin 27 parallel to the axis of the collar. A cam 28 at the end of a lever 29 in the form of a question mark pivots on this pin, the curved portion fitting snugly in the recess 25 and the straight end portion projecting proud of the collar to provide a handle. The cam is so shaped that, when the lever 29 is closed to the Figure 5 position, the maximum radius part of the cam circumference registers with the inner mouth of the aperture 26, slightly proud of the inside circumference of the collar. When levered out to the dotted line position, a lesser radius part of the cam 28 is presented to the inside of the collar 23. Thus, the locking device can be slid on to the rod 10 with the cam member released and, when it is hard up against a weight, the lever 29 is snapped in to close against the collar, clamping it to the rod. Release and removal is just as quick and easy. It will be understood that the maximum radius of the cam will move just past the radius of the collar through the pin 27 as the lever is pressed home, thus giving an 'over-centre' action.

#### CLAIMS

1. A physical exercise bar on whose opposite ends selected weights can be mounted, the bar having intermediate handles whose positions can be varied.
2. A physical exercise bar as claimed in claim 1, wherein the handles are rotatable about axes transverse to the longitudinal direction of the bar.
3. A bar as claimed in claim 2, wherein the handles are freely rotatable.
4. A bar as claimed in claim 2, wherein the bars are lockable in selected positions.
5. A bar as claimed in claim 2, wherein the freedom of rotation of the handles is adjustable by friction means.
6. A bar as claimed in any one of claims 2 to 5, wherein the possible rotation is through 360°.
7. A bar as claimed in any preceding claim, wherein the handles are mounted on rings captive to a frame forming an intermediate section of the bar.
8. A bar as claimed in claim 7, wherein the handles are diametral elements spanning the respective rings.
9. A bar as claimed in claim 7 or 8, wherein the frame is oblong with rounded ends, these being engaged by approximately half the circumference of the rings, and wherein a retaining member with concave ends to be engaged by the other circumferential portions is fitted within the frame to keep the rings captive.
10. A physical exercise bar substantially as hereinbefore described with reference to the accompanying drawings.
11. A clamp comprising a collar and cam means pivotally mounted thereon to be movable between two positions, in one of which a portion thereof projects inwardly of the internal circumference of the collar and in the other of which no portion so projects.
12. A clamp as claimed in Claim 11, wherein the cam has an over-centre action in which another

portion thereof projects inwardly to a greater extent than the first portion at a position intermediate said two positions.

13. A clamp as claimed in Claim 11 or 12, wherein  
5 the cam pivot axis is parallel to the collar axis.

14. A clamp as claimed in Claim 11, 12 or 13,  
wherein the cam is housed in a radial aperture in said collar.

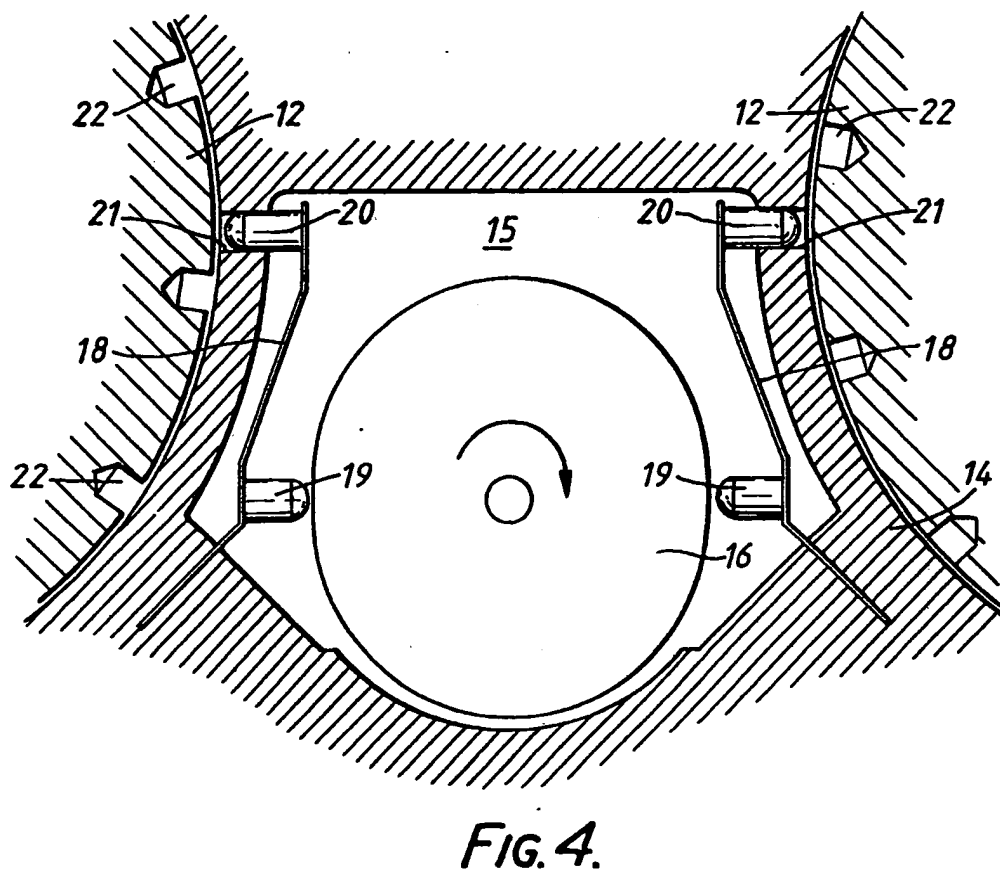
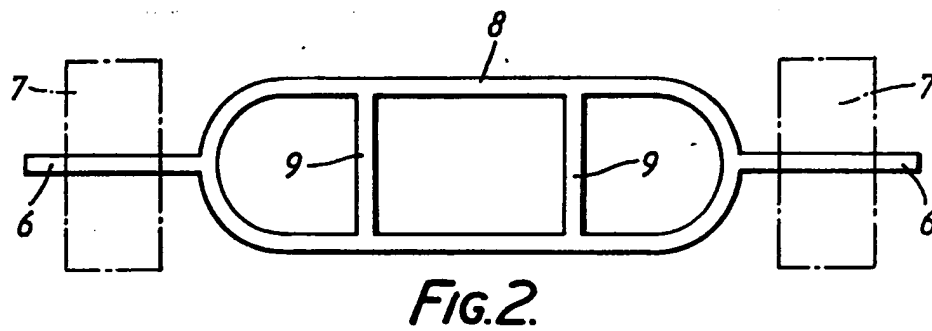
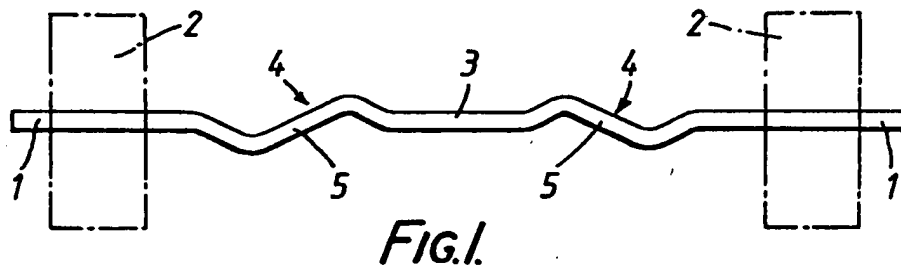
15. A clamp as claimed in Claim 14, wherein the  
10 cam has an operating lever which, in said one position, closely embraces a substantial portion of the outer circumference of the collar.

16. A clamp as claimed in Claim 15, wherein said  
substantial portion is recessed to house the lever, the  
15 latter having an end portion which remains proud of the recess when the cam is in said one position.

17. A clamp substantially as hereinbefore  
described with reference to Figures 5 and 6 of the  
accompanying drawings.

20 18. A physical exercise bar as claimed in any one of claims 1 to 10, with clamps for retaining weights each as claimed in any one of claims 11 to 17, the collars having a sliding fit on the bar ends.

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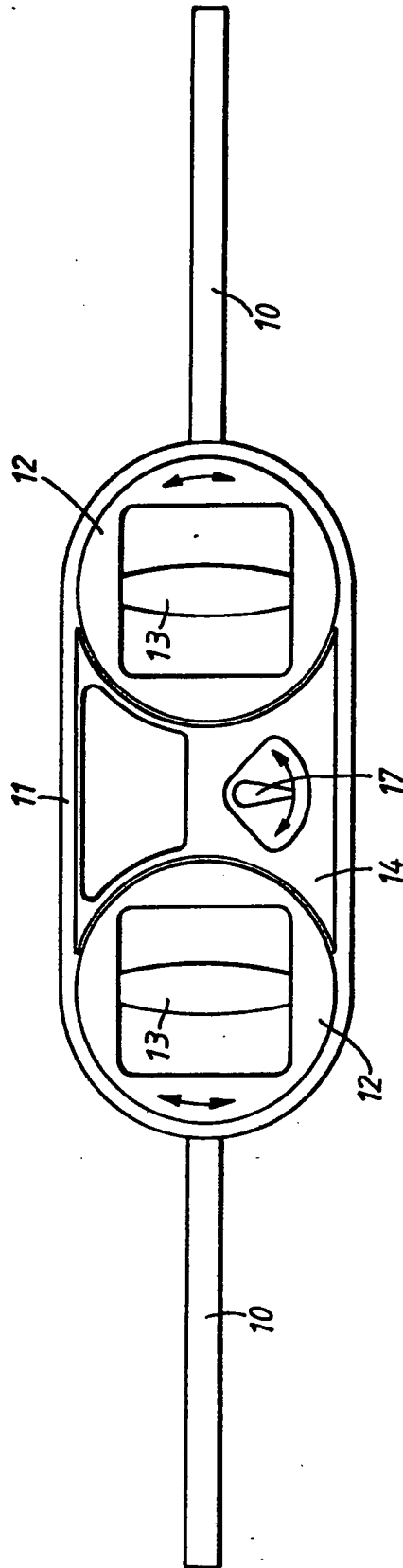


FIG. 3.

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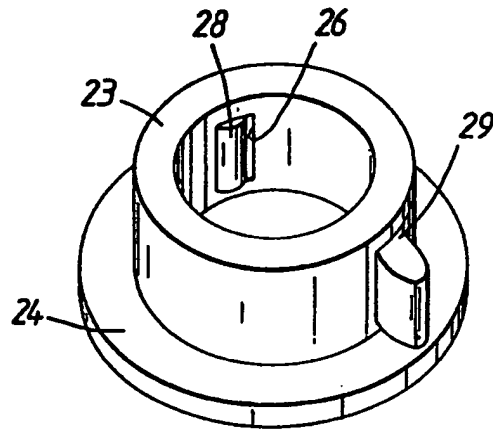


FIG. 5.

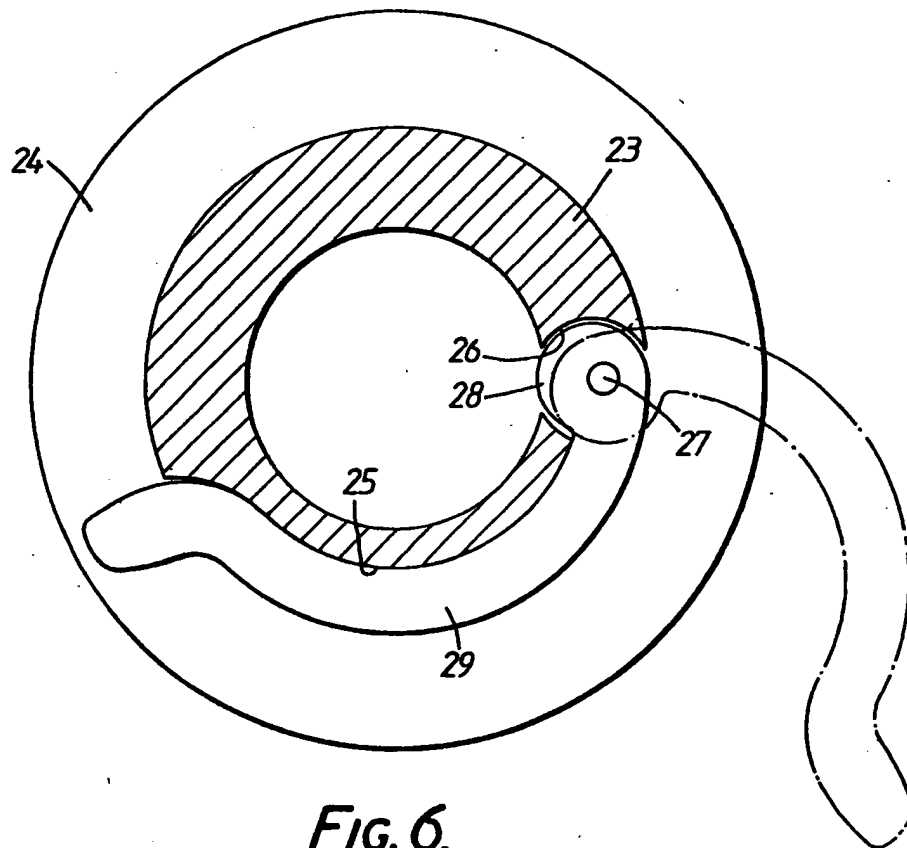


FIG. 6.